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(54) **VOLUMETRIC VIRTUAL REALITY KEYBOARD METHODS, USER INTERFACE, AND INTERACTIONS**

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(57) **ABSTRACT**

Systems and methods are described that include generating a virtual environment for display in a head-mounted display device. The virtual environment may include at least one three-dimensional virtual object having a plurality of volumetric zones configured to receive virtual contact. The method may also include detecting a plurality of inputs corresponding to a plurality of actions performed in the virtual environment on the at least one three-dimensional virtual object. Each action corresponds to a plurality of positions and orientations associated with at least one tracked input device. The method may include generating, for each action and while detecting the plurality of inputs, a plurality of prediction models and determining based on the plurality of prediction models in which of the plurality of volumetric zones the at least one tracked input device is predicted to virtually collide.

20 Claims, 9 Drawing Sheets